

## AMENDMENTS TO THE CLAIMS

Claims 1-38 (canceled)

39. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an m-level QAM to produce a modulated signal;

- a transmitter operable to transmit the modulated signal as the first transmission signal;

- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an m-level QAM, the third data stream is modulated according to an n-level QAM, and the second data stream has information of n; and

- a demodulator operable to demodulate the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of n obtained from the second data stream.

40. (new) A telephone according to claim 39, wherein m is an integer and equal to or less than 4.

41. (new) A telephone according to claim 39, wherein n is an integer and equal to or greater than 4.

42. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an m-level PSK to produce a modulated signal;

- a transmitter operable to transmit the modulated signal as the first transmission signal;

- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data

stream is modulated according to an m-level PSK, the third data stream is modulated according to an n-level PSK, and the second data stream has information of n; and

- a demodulator operable to demodulate the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of n obtained from the second data stream.

43. (new) A telephone according to claim 42, wherein m is an integer and equal to or less than 4.

44. (new) A telephone according to claim 42, wherein n is an integer and equal to or greater than 4.

45. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to assign a first data stream to a constellation in a vector space diagram to produce a modulated signal, wherein the number of signal points of the constellation for the first data stream is m;

- a transmitter operable to transmit the modulated signal;

- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the number of signal points of the constellation for the second data stream is m, the number of signal points of the constellation for the third data stream is n, and the second data stream has information of n; and

- a demodulator operable to demodulate the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of n obtained from the second data stream.

46. (new) A telephone according to claim 45, wherein m is an integer and equal to or less than 4.

47. (new) A telephone according to claim 45, wherein  $n$  is an integer and equal to or greater than 4.

48. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an  $m$ -level QAM to produce a first modulated signal;

- a multiplexer operable to convert the first modulated signal to a CDMA converted signal according to CDMA;

- a transmitter operable to transmit the CDMA converted signal as the first transmission signal;

- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an  $m$ -level QAM, the third data stream is modulated according to an  $n$ -level QAM, and the second data stream has information of  $n$ ;

- a de-multiplexer operable to convert the second transmission signal to a second modulated signal according to CDMA; and

- a demodulator operable to demodulate the second modulated signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

49. (new) A telephone according to claim 48, wherein  $m$  is an integer and equal to or less than 4.

50. (new) A telephone according to claim 48, wherein  $n$  is an integer and equal to or greater than 4.

51. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an m-level PSK to produce a first modulated signal;

- a multiplexer operable to convert the first modulated signal to a CDMA converted signal according to CDMA;

- a transmitter operable to transmit the CDMA converted signal as the first transmission signal;

- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an m-level PSK, the third data stream is modulated according to an n-level PSK, and the second data stream has information of n;

- a de-multiplexer operable to convert the second transmission signal to a second modulated signal according to CDMA; and

- a demodulator operable to demodulate the second modulated signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of n obtained from the second data stream.

52. (new) A telephone according to claim 51, wherein m is an integer and equal to or less than 4.

53. (new) A telephone according to claim 51, wherein n is an integer and equal to or greater than 4.

54. (new) A telephone for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- a modulator operable to assign a first data stream to a constellation in a vector space diagram to produce a first modulated signal, wherein the number of signal points of the constellation for the first data stream is  $m$ ;
- a multiplexer operable to convert the first modulated signal to a CDMA converted signal according to CDMA;
- a transmitter operable to transmit the CDMA converted signal as the first transmission signal;
- a receiver operable to receive the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the number of signal points of the constellation for the second data stream is  $m$ , the number of signal points of the constellation for the third data stream is  $n$ , and the second data stream has information of  $n$ ;
- a de-multiplexer operable to convert the second transmission signal to a second modulated signal according to CDMA; and
- a demodulator operable to demodulate the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

55. (new) A telephone according to claim 54, wherein  $m$  is an integer and equal to or less than 4.

56. (new) A telephone according to claim 54, wherein  $n$  is an integer and equal to or greater than 4.

57. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an  $m$ -level QAM and modulate a second data stream according to an  $n$ -level QAM to produce modulated signals, wherein the first data stream has information of  $n$ ;

- a transmitter operable to transmit the modulated signals as the second transmission signal;
- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level QAM; and
- a demodulator operable to demodulate the first transmission signal to produce the third data stream.

58. (new) A base station according to claim 57, wherein m is an integer and equal to or less than 4.

59. (new) A base station according to claim 57, wherein n is an integer and equal to or greater than 4.

60. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an m-level PSK and modulate a second data stream according to an n-level PSK to produce modulated signals, wherein the first data stream has information of n;
- a transmitter operable to transmit the modulated signals as the second transmission signal;
- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level PSK; and
- a demodulator operable to demodulate the first transmission signal to produce the third data stream.

61. (new) A base station according to claim 60, wherein m is an integer and equal to or less than 4.

62. (new) A base station according to claim 60, wherein  $n$  is an integer and equal to or greater than 4.

63. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to assign a first data stream to a constellation in a vector space diagram and assign a second data stream to a constellation in a vector space diagram to produce modulated signals, wherein the number of signal points of the constellation for the first data stream is  $m$ , the number of signal points of the constellation for the second data stream is  $n$ , and the first data stream has information of  $n$ ;

- a transmitter operable to transmit the modulated signals as the second transmission signal;

- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the number of signal points of the constellation for the third data stream is  $m$ ; and

- a demodulator operable to demodulate the first transmission signal to produce the third data stream.

64. (new) A base station according to claim 63, wherein  $m$  is an integer and equal to or less than 4.

65. (new) A base station according to claim 63, wherein  $n$  is an integer and equal to or greater than 4.

66. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an  $m$ -level QAM and modulate a second data stream according to an  $n$ -level QAM to produce modulated signals, wherein the first data stream has information of  $n$ ;

- a multiplexer operable to convert the modulated signals to a CDMA converted signal according to CDMA;
- a transmitter operable to transmit the CDMA converted signal as the second transmission signal;
- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level QAM;
- a de-multiplexer operable to convert the first transmission signal to a modulated signal according to CDMA; and
- a demodulator operable to demodulate the modulated signal to produce the third data stream.

67. (new) A base station according to claim 66, wherein m is an integer and equal to or less than 4.

68. (new) A base station according to claim 66, wherein n is an integer and equal to or greater than 4.

69. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to modulate a first data stream according to an m-level PSK and modulate a second data stream according to an n-level PSK to produce modulated signals, wherein the first data stream has information of n;
- a multiplexer operable to convert the modulated signals to a CDMA converted signal according to CDMA;
- a transmitter operable to transmit the CDMA converted signal as the second transmission signal;



- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level PSK;

- a de-multiplexer operable to convert the first transmission signal to a modulated signal according to CDMA; and

- a demodulator operable to demodulate the modulated signal to produce the third data stream.

70. (new) A base station according to claim 69, wherein m is an integer and equal to or less than 4.

71. (new) A base station according to claim 69, wherein n is an integer and equal to or greater than 4.

72. (new) A base station for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- a modulator operable to assign a first data stream to a constellation in a vector space diagram and assign a second data stream to a constellation in a vector space diagram to produce modulated signals, wherein the number of signal points of the constellation for the first data stream is m, the number of signal points of the constellation for the second data stream is n, and the first data stream has information of n;

- a multiplexer operable to convert the modulated signals to a CDMA converted signal according to CDMA;

- a transmitter operable to transmit the CDMA converted signal as the second transmission signal;

- a receiver operable to receive the first transmission signal, wherein the first transmission signal has information of a third data stream, and the number of signal points of the constellation for the third data stream is m;

- a de-multiplexer operable to convert the first transmission signal to a modulated signal according to CDMA; and

- a demodulator operable to demodulate the modulated signal to produce the third data stream.

73. (new) A base station according to claim 72, wherein  $m$  is an integer and equal to or less than 4.

74. (new) A base station according to claim 72, wherein  $n$  is an integer and equal to or greater than 4.

75. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level QAM to produce a modulated signal;
- transmitting the modulated signal as the first transmission signal;
- receiving the second transmission signal, wherein the second transmission signal has

information of a second data stream and a third data stream, the second data stream is modulated according to an  $m$ -level QAM, the third data stream is modulated according to an  $n$ -level QAM, and the second data stream has information of  $n$ ; and

- demodulating the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

76. (new) A transmission and receiving method according to claim 75, wherein  $m$  is an integer and equal to or less than 4.

77. (new) A transmission and receiving method according to claim 75, wherein  $n$  is an integer and equal to or greater than 4.

78. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- modulating a first data stream according to an m-level PSK to produce a modulated signal;
- transmitting the modulated signal as the first transmission signal;
- receiving the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an m-level PSK, the third data stream is modulated according to an n-level PSK, and the second data stream has information of n; and
- demodulating the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of n obtained from the second data stream.

79. (new) A transmission and receiving method according to claim 78, wherein m is an integer and equal to or less than 4.

80. (new) A transmission and receiving method according to claim 78, wherein n is an integer and equal to or greater than 4.

81. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- assigning a first data stream to a constellation in a vector space diagram to produce a modulated signal, wherein the number of signal points of the constellation for the first data stream is m;
- transmitting the modulated signal;
- receiving the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the number of signal points of the constellation for the second data stream is m, the number of signal points of the constellation for the third data stream is n, and the second data stream has information of n; and

- demodulating the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

82. (new) A transmission and receiving method according to claim 81, wherein  $m$  is an integer and equal to or less than 4.

83. (new) A transmission and receiving method according to claim 81, wherein  $n$  is an integer and equal to or greater than 4.

84. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level QAM to produce a first modulated signal;

- converting the first modulated signal to a CDMA converted signal according to CDMA;

- transmitting the CDMA converted signal as the first transmission signal;

- receiving the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an  $m$ -level QAM, the third data stream is modulated according to an  $n$ -level QAM, and the second data stream has information of  $n$ ;

- converting the second transmission signal to a second modulated signal according to CDMA; and

- demodulating the second modulated signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

85. (new) A transmission and receiving method according to claim 84, wherein  $m$  is an integer and equal to or less than 4.

86. (new) A transmission and receiving method according to claim 84, wherein  $n$  is an integer and equal to or greater than 4.

87. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level PSK to produce a first modulated signal;

- converting the first modulated signal to a CDMA converted signal according to CDMA;

- transmitting the CDMA converted signal as the first transmission signal;

- receiving the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the second data stream is modulated according to an  $m$ -level PSK, the third data stream is modulated according to an  $n$ -level PSK, and the second data stream has information of  $n$ ;

- converting the second transmission signal to a second modulated signal according to CDMA; and

- demodulating the second modulated signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

88. (new) A transmission and receiving method according to claim 87, wherein  $m$  is an integer and equal to or less than 4.

89. (new) A transmission and receiving method according to claim 87, wherein  $n$  is an integer and equal to or greater than 4.

90. (new) A transmission and receiving method for transmitting a first transmission signal and receiving a second transmission signal, comprising:

- assigning a first data stream to a constellation in a vector space diagram to produce a first modulated signal, wherein the number of signal points of the constellation for the first data stream is  $m$ ;

- converting the first modulated signal to a CDMA converted signal according to CDMA;

- transmitting the CDMA converted signal as the first transmission signal;

- receiving the second transmission signal, wherein the second transmission signal has information of a second data stream and a third data stream, the number of signal points of the constellation for the second data stream is  $m$ , the number of signal points of the constellation for the third data stream is  $n$ , and the second data stream has information of  $n$ ;

- converting the second transmission signal to a second modulated signal according to CDMA; and

- demodulating the second transmission signal to produce the second data stream and the third data stream, wherein the third data stream is produced according to the information of  $n$  obtained from the second data stream.

91. (new) A transmission and receiving method according to claim 90, wherein  $m$  is an integer and equal to or less than 4.

92. (new) A transmission and receiving method according to claim 90, wherein  $n$  is an integer and equal to or greater than 4.

93. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level QAM and modulating a second data stream according to an  $n$ -level QAM to produce modulated signals, wherein the first data stream has information of  $n$ ;

- transmitting the modulated signals as the second transmission signal;

- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level QAM; and
- demodulating the first transmission signal to produce the third data stream.

94. (new) A receiving and transmitting method according to claim 93, wherein m is an integer and equal to or less than 4.

95. (new) A receiving and transmitting method according to claim 93, wherein n is an integer and equal to or greater than 4.

96. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- modulating a first data stream according to an m-level PSK and modulating a second data stream according to an n-level PSK to produce modulated signals, wherein the first data stream has information of n;

- transmitting the modulated signals as the second transmission signal;
- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an m-level PSK; and
- demodulating the first transmission signal to produce the third data stream.

97. (new) A receiving and transmitting method according to claim 96, wherein m is an integer and equal to or less than 4.

98. (new) A receiving and transmitting method according to claim 96, wherein n is an integer and equal to or greater than 4.

99. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- assigning a first data stream to a constellation in a vector space diagram and assigning a second data stream to a constellation in a vector space diagram to produce modulated signals, wherein the number of signal points of the constellation for the first data stream is  $m$ , the number of signal points of the constellation for the second data stream is  $n$ , and the first data stream has information of  $n$ ;

- transmitting the modulated signals as the second transmission signal;

- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the number of signal points of the constellation for the third data stream is  $m$ ; and

- demodulating the first transmission signal to produce the third data stream.

100. (new) A receiving and transmitting method according to claim 99, wherein  $m$  is an integer and equal to or less than 4.

101. (new) A receiving and transmitting method according to claim 99, wherein  $n$  is an integer and equal to or greater than 4.

102. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level QAM and modulating a second data stream according to an  $n$ -level QAM to produce modulated signals, wherein the first data stream has information of  $n$ ;

- converting the modulated signals to a CDMA converted signal according to CDMA;

- transmitting the CDMA converted signal as the second transmission signal;

- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an  $m$ -level QAM;

- converting the first transmission signal to a modulated signal according to CDMA; and

- demodulating the modulated signal to produce the third data stream.



103. (new) A receiving and transmitting method according to claim 102, wherein  $m$  is an integer and equal to or less than 4.

104. (new) A receiving and transmitting method according to claim 102, wherein  $n$  is an integer and equal to or greater than 4.

105. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- modulating a first data stream according to an  $m$ -level PSK and modulating a second data stream according to an  $n$ -level PSK to produce modulated signals, wherein the first data stream has information of  $n$ ;

- converting the modulated signals to a CDMA converted signal according to CDMA;

- transmitting the CDMA converted signal as the second transmission signal;

- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the third data stream is modulated according to an  $m$ -level PSK;

- converting the first transmission signal to a modulated signal according to CDMA; and

- demodulating the modulated signal to produce the third data stream.

106. (new) A receiving and transmitting method according to claim 105, wherein  $m$  is an integer and equal to or less than 4.

107. (new) A receiving and transmitting method according to claim 105, wherein  $n$  is an integer and equal to or greater than 4.

108. (new) A receiving and transmitting method for receiving a first transmission signal and transmitting a second transmission signal, comprising:

- assigning a first data stream to a constellation in a vector space diagram and assigning a second data stream to a constellation in a vector space diagram to produce modulated signals,

wherein the number of signal points of the constellation for the first data stream is  $m$ , the number of signal points of the constellation for the first data stream is  $n$ , and the first data stream has information of  $n$ ;

- converting the modulated signals to a CDMA converted signal according to CDMA;
- transmitting the CDMA converted signal as the second transmission signal;
- receiving the first transmission signal, wherein the first transmission signal has information of a third data stream, and the number of signal points of the constellation for the third data stream is  $m$ ;

- converting the first transmission signal to a modulated signal according to CDMA; and
- demodulating the modulated signal to produce the third data stream.

109. (new) A receiving and transmitting method according to claim 108, wherein  $m$  is an integer and equal to or less than 4.

110. (new) A receiving and transmitting method according to claim 108, wherein  $n$  is an integer and equal to or greater than 4.